

Features

- Built-in diagnostic function to detect short and open circuiting of loads and output status signals
- DMOS 3ch output
- Allows ON/OFF using C-MOS logic level
- Built-in overcurrent and thermal protection circuits

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit	Conditions
Power supply voltage	V_B	35	V	
Input terminal voltage	V_{IN}	-0.3 to 7	V	
Input terminal current	I_{IN}	5	mA	
DG terminal voltage	V_{DG}	-0.3 to 7	V	
DG terminal current	I_{DG}	5	mA	
Drain to source voltage	V_{DS}	V_B-45	V	
Output current	I_O	1.8	A	
Power dissipation	P_D	2.7	W	$T_a=25^{\circ}\text{C}$, all circuit operating
Source to drain D_i forward current	I_F	0.8	A	
Channel temperature	T_{ch}	150	$^{\circ}\text{C}$	
Operating temperature	T_{OP}	-40 to +105	$^{\circ}\text{C}$	
Storage temperature	T_{stg}	-40 to +150	$^{\circ}\text{C}$	

Electrical Characteristics

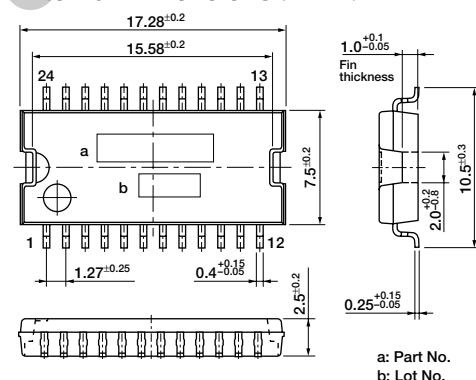
(V_B = 14V, I_a = 25 mA unless otherwise specified)

Parameter	Symbol	Ratings			Unit	Conditions	
		min	typ	max			
Operating power supply voltage	V _{B(OPP)}	5.5		35	V		
Quiescent circuit current	I _q			1	mA	V _{IN} =0V, V _{OUT} =0V	
Output ON resistance	R _{DS(ON)}			200	mΩ	I _O =1A	
				350	mΩ	I _O =1A, T _a =80°C	
Output leak current	I _{O, leak}		50	100	μA	V _{OUT} =0V	
Input threshold voltage	Output ON	V _{IHth}	1.4	2.0	3.0	V	T _a = -40 to +105°C
	Output OFF	V _{ILth}	1.0	1.8		V	T _a = -40 to +105°C
Inpup current	Output ON	I _{IH}		70	200	μA	V _{IN} =5V
	Output OFF	I _{IL}			12	μA	V _{IN} =0V
Overcurrent protection startling current	I _S	1.9	3		A	V _{OUT} =V _O -1.5V	
Internal current limit	I _{Lim}		5		A	V _{OUT} =0V	
Thermal shutdown operating temperature	T _{TSD}	155	165		°C		
Load open detection threshold voltage	V _{open}	1.5	3	4.5	V		
Output transfer time	T _{ON}		70	140	μs	R _L =14Ω, V _{OUT} =V _B -5V	
	T _{OFF}		35	90	μs	R _L =14Ω, V _B ±10%	
DG leak current	I _{DG}			20	μA	V _{DG} =5.5V	
Low level DG output voltage	V _{DGL}		0.15	0.5	V	I _{DG} =1.6mA	
DG output transfer time	T _{PLH}		70	140	μs		
	T _{PHL}		45	120	μs		

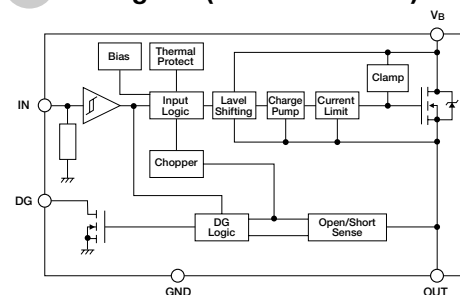
Recommended Operating Conditions (for one channel)

Parameter	Ratings		Unit
	min	max	
Power supply voltage	5.5	16	V
V _{IH}	4	5.5	V
V _{IL}	−0.3	0.9	V
I _O		1	A
R _{IN}	10	20	kΩ
R _{DS}	10	20	kΩ

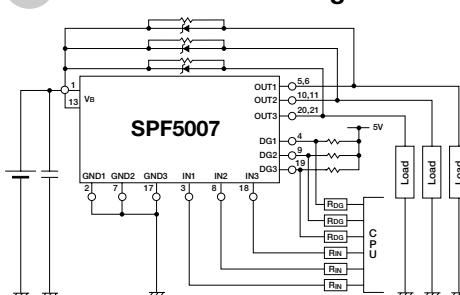
External Dimensions (unit: mm)



Block Diagram (for one channel)

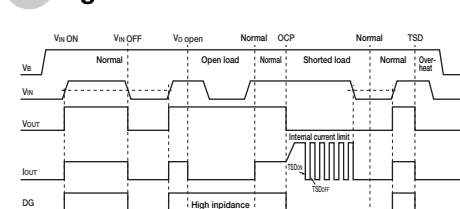


Standard Connection Diagram



- * R_{IN} and R_{DG} are needed to protect CPU and SPF5007 in case of reverse connection of V_B terminal.
- * Make V_B of 1Pin and 13Pin short from the fin to be plated by solder.

Timing Chart



Mode	V _{IN}	DG	V _O
Normal	H L	H L	H L
Open load	H L	H H	H H
Shorted load	H L	L L	L (Limiting)
Overheat	H L	L L	L L